

NOTES ON SOME BENTHONIC OPISTHOBRANCHS FROM PORT PHILLIP BAY, VICTORIA

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SUMMARY

Ten species of opisthobranchs and two species of pyramidellids are recorded from soft bottom benthonic samples obtained during the Environmental Study of Port Phillip Bay 1968-1973. A new genus, *Austrocylichna*, type species *Bulla (Atys) exigua* A. Adams, 1854, and two new species, *Ercolania margaritae* and *Cerberilla incola*, are described.

INTRODUCTION

Opisthobranch molluscs are common within Port Phillip Bay, Victoria, especially intertidally and near the entrance from Bass Strait (Burn, 1966c). Benthonic species from soft bottom areas within the Bay are less well known, the available records suggesting that there is a high proportion of shell-bearing species present.

The species recorded in this paper were collected by the Marine Pollution Group, Fisheries and Wildlife Division (FWD in text), during the Environmental Study of Port Phillip Bay between 1968 and 1973 (see Mahon, 1973, for full details). They were sorted from sediment samples obtained by Smith-McIntyre grabs of an area 0.1 m². Samples were taken from 86 stations on a regular grid over the whole Bay, together with 26 nearshore stations on the 4 m and 8 m depth contours in three areas of known input sources. Only the 36 stations at which opisthobranchs were obtained are shown in the accompanying map of the Bay.

Through the generous help of Dr B. J. Smith, National Museum of Victoria, Melbourne, it has been possible to examine type material of Australian opisthobranchs from the collections of the British Museum (Natural History), London, and the Muséum National d'Histoire Naturelle, Paris. This has verified several species and necessitated taxonomic changes for others.

The writer is greatly indebted to Dr G. C. B. Poore, Senior Research Officer, Marine Pollution Studies Group Fisheries and Wildlife Division, Melbourne, for the opportunity to examine and report upon these opisthobranchs. Type specimens and some other material has already been presented to the National Museum of Victoria, Melbourne (NMV in text), and the remainder of the collection will be deposited there at a later date. The writer expresses his gratitude to the Science and Industry Endowment Fund, C.S.I.R.O., Canberra, for continued support of this and other research on the Australian opisthobranch molluscs.

The specimens are listed in the Systematic Section in the following manner: station number first, number of specimens from station in parenthesis.

SYSTEMATIC SECTION

Pyramidellidae

Chemnitzia mariae (Tenison Woods, 1876)

References. May, 1923: pl. 44, fig. 29; Laseron, 1951: 320.

Material. Fifteen specimens from five FWD stations: 907 (2) NE of Werribee River mouth, 6 m; 918 (1) E of Ricketts Point, 4 m; 985 (10) S of Rosebud, 12 m; 1218 (1) off Point Ormond, 4 m; 1252 (1) off Werribee River mouth, 4 m.

Remarks. Though 38 species of Pyramidellidae are recorded from Victoria (Macpherson and Gabriel, 1962: 122), no proper conchological treatment of the family has been undertaken, for example as has been for New South Wales (Laseron, 1951) or northern Australia (Laseron, 1959). Only one Australian species, *Linopyrga pascoei* (Angas), has had the animal described and figured (Hedley, 1917: 716, pl. 46, fig. 5). The writer's observations on some Victorian species indicate considerable anatomical differences, difficult to assess taxonomically.

The present shells agree well with May's figure of the type from Tasmania (1923: pl. 44, fig. 29) in the slender tapering shape, oblique ribs, and deep aperture. They differ from New South Wales' specimens (Laseron, 1951: fig. 53) in that the shell is more slender and the ribs less oblique. Some specimens differ from both the latter figure and the type in that the whorls are straight-sided and abruptly impressed at the sutures. Other specimens are slightly rounded on the whorls as in the type.

No real attempt has been made to examine the animals. Obvious points about the head are that the tentacles are short, tapering and hollowed laterally, the large black eyes lie between the tentacle bases, and black pigment is present along the mantle edge and on the roof of the pallial cavity. The operculum is oval, thin and pale yellowish.

Pyrgiscus fusca. (A. Adams, 1853)

References. May, 1923: pl. 44, fig. 27; Laseron, 1951: 322.

Material. Six specimens from six FWD stations: 902 (1) off Williamstown, 10 m; 910 (1) W of Sandringham, 16 m; 911 (1) W of Sandringham, 15 m; 926 (1) SW of Ricketts Point, 20 m; 957 (1) W of Frankston, 24 m; 982 (1) N of Rosebud, 15 m.

Remarks. The shells of *P. fusca* are far thinner and more fragile than those of *Chemnitzia mariae*, and in all cases have dissolved completely away after four years in preservative. The animals are buff in colour, without any pigment, and extend to the innermost part of the protoconch. Tentacles are short, tapering, and hollowed laterally, and the eyes are large and lie between the tentacle bases. The operculum is transparent and oval in shape.

Scaphandridae

Austrocylichna gen. nov.

Shell ovate, slender, weakly striated anteriorly and posteriorly, smooth medially; vertex shallow, perforated, protoconch not visible; columella



Port Phillip Bay, showing localities mentioned in text and Fisheries and Wildlife Division stations at which opisthobranchs occurred.

straight, with wide labrum behind which lies a deep slender umbilicus, posterior margin of aperture twisted. Animal with head posteriorly bilobed and ridge-like Hancock's organs; foot short, truncate behind, with small parapodia; jaws with large elements; radula with 4.1.1.1.4 teeth, rhachidian smooth, lateral denticulate, marginals smooth; gastral plates three, transversely ridged; nerve ring in front of pharynx; male copulatory organ with unarmed plicate atrium.

Type species: *Bulla (Atys) exigua* A. Adams, 1854.

Austrocylichna combines *Atys*-like features of a twisted posterior margin of the aperture and transversely ridged gastral plates, and *Cylichna*-like columella and radula. It comes closest to *Cylichnatys* Kuroda and Habe, 1952, from Japan, which also has smooth rhachidian and ridged gastral plates, but that genus has an entirely stiate shell without the twisted posterior margin and pectinate rather than denticulate lateral teeth, and no marginal teeth. The Japanese authors placed their genus in the family Atysidae, but here both *Cylichnatys* and *Austrocylichna* are referred to the Scaphandridae because of overall radular similarities to the latter family.

Roxaniella Monterosato, 1884, from the Mediterranean Sea is similar in shell shape to *Austrocylichna*, but has shorter columella and non-twisted posterior margin of the aperture. The animal of *Cylichna jeffereysi* Wein-kauf, 1866, the type of *Roxaniella*, is unknown. Its discovery could well lead to the synonymizing of one or other of the above genera with *Roxaniella*.

Austrocylichna exigua (A. Adams, 1854)

Figures 1-5

Bulla (Atys) exigua A. Adams, 1954: 589, pl. 125, fig. 129; 1878: 869.

Atys exigua Reeve, 1869: pl. 4, fig. 19; Pilsbry, 1893: 270, pl. 28, fig. 24.

Roxania exigua Tate and May, 1901: 417; Pritchard and Gatliff, 1903: 213; May, 1921: 103; 1923: pl. 46, fig. 13; Cotton and Godfrey, 1933: 82, pl. 1, fig. 11.

Damoniella exigua. Cotton and Godfrey, 1939: 33; Cotton, 1959: 406; Macpherson and Chapple, 1951: 139; Macpherson and Gabriel, 1962: 246.

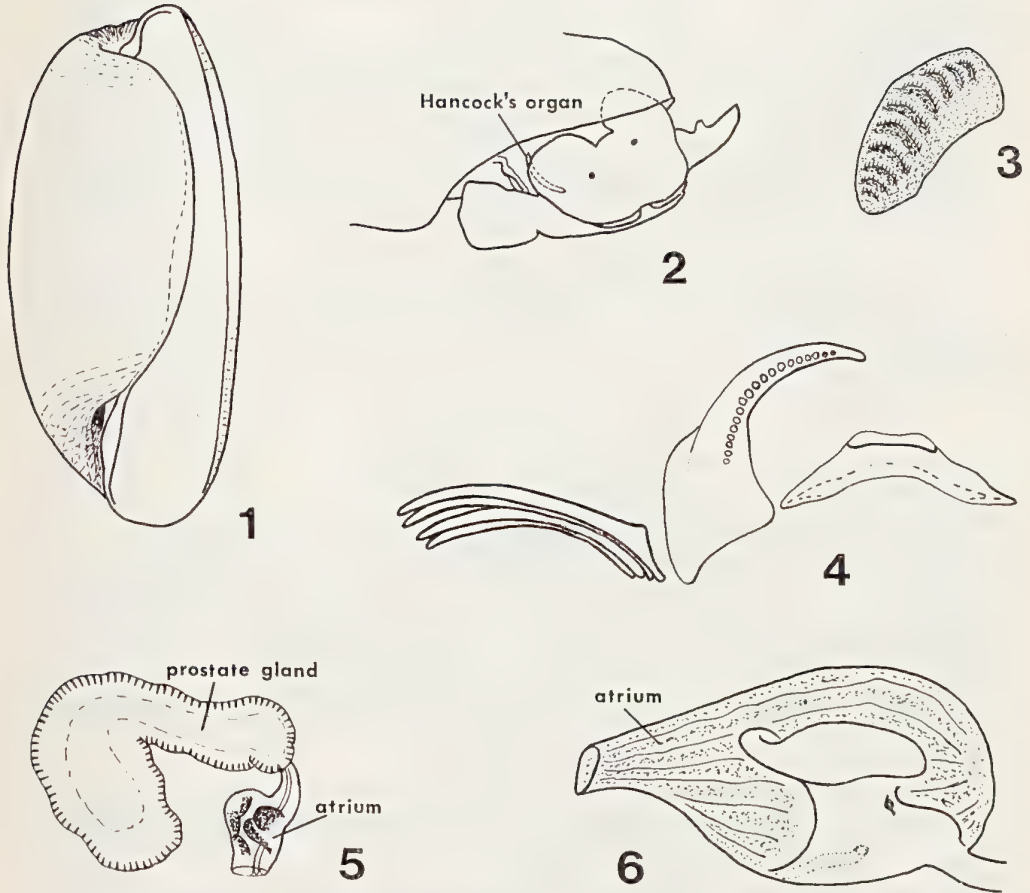
Material. Five specimens (NMV F27918) from one FWD nearshore station: 1247 (5) 4 km SSW of mouth of Patterson River, 8 m.

Twenty-one dry shells (NMV F27917), some with dried animals, dredged from 15 m off Point Cook, collected by C. J. Gabriel.

One specimen (Holotype, BMNH 19748), Port Lincoln, South Australia.

Description. Shell (Fig. 1) small, elongate ovoid (in large specimens subcylindrical, slightly narrower posteriorly), anteriorly rounded, posteriorly obliquely truncate. Colour translucent with thin fragile yellowish fawn periostracum in live material, opaque white in dead shells. Growth lines visible but not developed. Spiral sculpture of about 20 strong striae anteriorly and 6 - 8 indistinct striae posteriorly, separated by a wide smooth section. Aperture slender, parallel anteriorly and narrowing to the third quarter, posteriorly wider, inner margin twisted and rising above the vertex. Columella long, straight, with wide labrum projecting over slender deep umbilicus. Vertex shallow, perforate, protoconch not visible. Dimensions (length x breadth): Holotype 4.0 x 2.0 mm, figured specimen 4.48 x 1.84 mm, other shells 5.3 x 2.17 mm, 5.0 x 2.17 mm, 4.83 x 1.87 mm, 4.26 x 1.71 mm.

Animal (Fig. 2) yellowish cream with black eyes in preservative; head wider than long, with shallow emargination in front edge, bilobed behind, lobes well separated; Hancock's organs each formed of a single thickened ridge on the body wall towards the rear of the head shield; seminal furrow with high margins; broad flat oral lobe each side of mouth projecting beyond head shield; foot short, rounded in front and



TEXT FIGURES 1-5. *Austrocylichna exigua* (A. Adams, 1854). 1. Shell. 2. Head of preserved animal. 3. Radula. 4. Gastral plate. 5. Male copulatory organ.

TEXT FIGURE 6. *Philine angasi* (Crosse and Fischer, 1864). Penial papilla.

behind, with triangular parapodia covering only anterior part of shell; epicochlear expansion large, filling posterior aperture; gill elongate triangular, with 6 transverse bipartite lamellae. Male copulatory organ (Fig. 5) crosses under oesophagus to left side of head and curls back to median line; atrium small and short, with several high plicae distinct from the seminal groove which continues through a shorter muscular duct to the soft, bulky prostate gland with wide lumen.

Jaws present, composed of a pair of areas of few large polygonal elements. Radula (Fig. 3) hyaline, 0.36 mm long, with 23 rows of 4.1.1.1.4 teeth; rhachidian tooth with broad base and thickened non-denticulate edge; lateral tooth large, scaphandroidal with long cusp bearing 20 - 22 pointed denticles on the outer side; four marginal teeth slender, curved. Gastral plates (Fig. 4) three, each about 0.5 mm long, yellowish.

with 10 chevron-like brownish ribs from which pointed elements project. Nerve ring in front of pharynx. Oesophagus without crop between pharynx and gizzard.

Discussion. The holotype is a white shining rolled shell with broken lip. It differs from the figured Point Cook specimen by being narrower posteriorly, by lacking the wide columellar labrum, and by being entirely smooth. Other specimens in the Point Cook material are identical, especially old rolled shells where the labrum is missing and the surface worn. All the examined specimens agree in the distinctively twisted inner lip of the posterior aperture.

According to the literature, *A. exigua* occurs from the far west of South Australia (St Francis Island 27-64 m, Cotton and Godfrey, 1933: 82) to Westernport Bay, central Victoria (Pritchard and Gatliff, 1903: 213) in the east, and as far south as d'Entrecasteaux Channel in Tasmania (Tate and May, 1901: 417).

Retusidae

Retusa pelyx Burn, 1974

Reference. Burn, in Burn and Bell, 1974: 37.

Material. Twenty-four specimens from eleven FWD stations in the eastern and northern parts of Port Phillip Bay: 1221 (1) off Williamstown, 8 m; 907 (2) off Werribee River, 8 m; 927 (1) S of Ricketts Point, 16 m; 948 (1), 950 (1), 957 (1) W of Frankston, 22, 18 and 15 m; 1246 (4) SSW of Patterson River mouth, 8 m; 963 (1), 970 (1) W of Mornington, 22 m; 982 (7) W of Dromana, 15 m; 984 (2) E of Sorrento, 12 m.

Further distribution. Victoria: Swan Bay, Queenscliff and Portarlington on western shores of Port Phillip Bay; Shallow Inlet. Tasmania: south and east coasts (May, 1923, as *R. iredaleana*).

Remarks. Burn and Bell (1974:40) have shown that this species has very selective food preferences for certain species of Foraminifera at the type locality population in Swan Bay. Foraminiferans are present in the gizzard of most specimens of the present collection, but the solution effects of the digestive juices of the living animals, and the formalin fixative, render them often too fragmentary for identification and comparison with available data. K. N. Bell could identify foraminiferans from two specimens only, in each case viewing them in situ through the transparent gizzard wall. One specimen from station 907 contained 1 *Qinquilocolina seminula*, 5 *Elphidium advenum* and 1 *E. seleyense*. The specimen from station 963 contained 1 *Ammonia aoteanus*. All species except *E. advenum* occur in the diet of *Retusa pelyx* at its intertidal type locality (Burn and Bell, 1974: 40).

R. pelyx is possibly the most common infaunal opisthobranch of Port Phillip Bay. It appears to be closely related to the broader species, *R. pygmaea* (A. Adams, 1854) of South Australia and *R. iredaleana* Hedley, 1914) of New South Wales.

Atysidae

Haminoea maugeansis Burn, 1966

References. Burn, 1966d: 330, fig. 1-2; 1969: 68, fig 1.

Opisthobranchs

Material. Sixty-two specimens from two FWD stations: 966 (4) Swan Bay, 2 m; 984 (58) E of Sorrento, 12 m.

Remarks. This is an epifaunal species browsing on minutae on the surface of shingle, algae and *Zostera*. Its eastern limit on the Victorian coastline is Corner Inlet. The largest specimens are found on the colder parts of the coastline, just west of Cape Otway and in the southeast of South Australia.

An additional specimen of very small size was noted among the gizzard contents of *Aglaja (Philinopsis) taronga* Allan, 1933, from station 928, N of Patterson River, 8 m.

Liloa brevis (Quoy and Gaimard, 1833)

Reference. Burn, 1969: 68, fig. 2-7.

Material. 137 specimens from five FWD stations: 918 (2) off Ricketts Point, 3 m; 966 (3) Swan Bay, 3 m; 1246 (2) and 1247 (1) SSW of Patterson River mouth, 8 m; 984 (129) E of Sorrento, 12 m.

Remarks. This infaunal species favours areas of sand, shingle and *Zostera*, where it is found ploughing through the surface of the substrate.

Examination of the two syntypes of this species from the Muséum National d'Histoire Naturelle, Paris, and other material from King George Sound, Western Australia, justifies the synonymy proposed previously by the writer (1969: 68).

The large sample of 129 specimens from station 984, where 58 specimens of *Haminoea maugeansis* also occurred, was sorted from four grabs, each of an area of 0.1 m². A very high density of opisthobranchs is indicated for this station.

Philinidae

Philine angasi (Crosse and Fischer, 1864)

Figure 6

References. Burn, 1966c: 266; 1969: 75.

Material. Twelve specimens from ten FWD stations: 902 (1) off Williamstown, 10 m; 914 (1), 916 (2) and 917 (1) between Werribee River mouth and Ricketts Point, 15-20 m; 929 (1) off Point Wilson, 6 m; 938 (1) off Patterson River mouth, 16 m; 944 (1) Portarlinton; 961 (1) off St Leonards, 21 m; 976 (1), 977 (1) SW off Mornington, 20 m.

Remarks. The 12 specimens range in length from 1.5 mm to 35 mm, and in each the gastral plates are about two-thirds the body length. Juvenile specimens up to 5 mm body length have extremely thin shells, the surface of which is sculptured by regularly spaced catenoid striae. Slightly larger specimens, up to 10 mm body length, still show signs of the catenoid sculpture but not at the lip.

Young specimens 2-4 mm in length appear in May each year in the shallow waters of Inner Corio Bay, Port Phillip Bay. At this time there appears to be a complete absence of adult specimens. The young specimens probably eat foraminiferans and other minutae. Larger specimens

and adults probably eat juveniles of *Notospisula trigonella* (Lamarck, 1818), a bivalve that abounds in the same area.

The penial papilla has been briefly described for *P. angasi* (Burn, 1969: 75), and this is now supplemented with a figure (Fig. 6) and additional notes. The penial sac has spongy plicate walls. The penial papilla is relatively small and very hard. From the base, it tapers to a shallow expanded rim, then tapers more abruptly until it meets the rolled flange of the apical disk. The disk has a wider flange at the edge nearest the external opening of the atrium. The aperture of the ejaculatory duct lies just below the flange on the inner side of the papilla. Though the whole penial sac might be everted during copulation, the penial papilla appears incapable of any tumescence or extension.

In overall pattern of the male copulatory organ, *P. angasi* is similar to *P. columnaria* Hedley and May, 1908 (Burn, 1969: 75), but in that species the penis has a cylindrical papilla directed into the atrial aperture and a tapering ejaculatory papilla with its own sheath.

Aglajidae

Aglaja (Philinopsis) taronga Allan, 1933

References. Burn, 1966a: 99; Rudman, 1972b: 381.

Material. One specimen from one FWD station: 328 (1) N of Patterson River mouth, 8 m.

Remarks. The specimen is a juvenile only 5 mm long as preserved. The distinctive colour pattern on the head shield of a pair of curved yellow stripes, a median pale stripe, brown margins and yellow sub-margins is similar to other colour descriptions of this species. The gut of the specimen contained a whole small *Haminoea maugeansis* Burn, 1966, foraminiferans and other animal remains, and sand grains. A larger 30 mm long specimen, from fine sand on the south side of the fishermen's channel, Queenscliff, collected by the writer on 6 October 1973, regurgitated three large *Retusa pelyx* Burn, 1974, one small *Haminoea maugeansis* Burn, 1966, and one small *Assimineia brazieri* Tenison Woods, 1876. New Zealand specimens were reported as eating *Aglaja (Melanochlamys)*, *Philine* and *Haminoea* (Rudman, 1972a: 555).

Until Rudman's studies (1970, 1972a, b, c, 1973) on the Aglajidae are all published, the writer prefers to retain the genus *Aglaja* in a conservative manner, with *Philinopsis* and *Melanochlamys* as subgenera.

The male copulatory organ from sexually mature specimens of *A. taronga* differs from that of the earlier described immature specimen (Burn, 1966a: 99) in the greater development of the coiled penial papilla.

Aglaja (Melanochlamys) queritor Burn, 1957

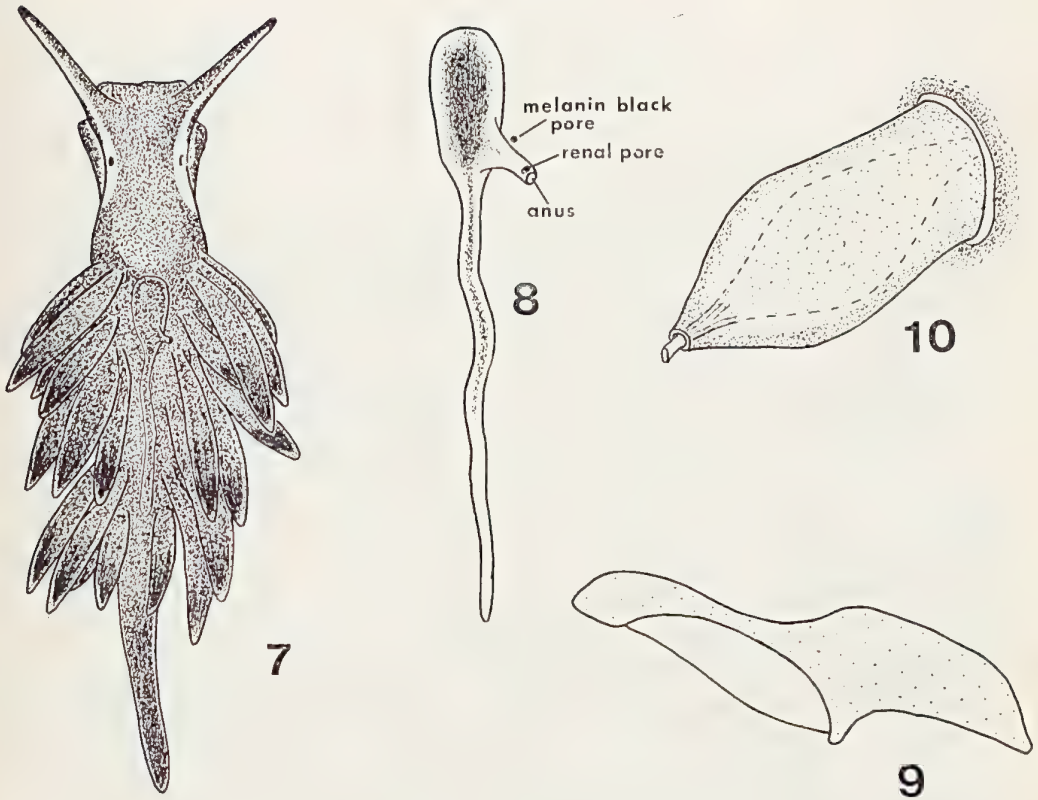
Aglaja queritor Burn, 1957b: 117; 1966c: 267; 1969: 73.

Aglaja (Melanochlamys) queritor. Rudman, 1972a: 54.

Aglaja henri Burn, 1969: 71.

Material. Forty-three specimens from one FWD station: 966 (43) Swan Bay, 2 m.

Remarks. Until now, the small black *A. queritor* has been regarded as occurring only among coralline algae on open and protected rocky reefs.



TEXT FIGURES 7-10. *Ercolania margaritae* sp. nov. 7. Live animal. 8. Pericardium. 9. Tooth. 10. Everted male copulatory organ.

Sand, mud-flat and *Zostera* habitats were occupied by the equally small but variably coloured *A. henri*. The present material consists of 19 all black specimens and 24 variably coloured specimens that cannot be separated anatomically. Comparison with specimens identified as *A. queritor* and *A. henri* from other localities along the Victorian coastline show that the differences in the male copulatory organs (Burn, 1969: 71, 73) are non-existent in specimens of the same size and sexual development. The low conical warts noted for *A. henri* are better described as concretions of aggregated white pigment cells; they are sometimes present upon the penial papilla.

A. henri is therefore reduced to a synonym of *A. queritor*. Distribution of the species is from Yanakie, Corner Inlet in the east to Port Fairy in the west.

Rudman (1972a) placed *A. queritor* in the genus *Melanochlamys* Cheeseman, 1881. The writer prefers the more conservative system where *Melanochlamys* is retained as a subgenus until such time as all species groups of the Aglajidae are properly known.

R. Burn

Stiligeridae

Ercolania margaritae sp. nov.

Figures 7-10

Material. One specimen from one FWD station: 919(1) S of Little River mouth, 4 m.

One hundred and three specimens from shallow surface pools on rock platform below lighthouse, Point Lonsdale, Victoria, on *Enteromorpha* and other slender green algae: 1 specimen (NMV F27924) 13 August 1961; 10 specimens (NMV F27926) 8 October 1961, all collected by R. and M. Burn; 91 specimens (NMV F27922 — Holotype, NMV F27923 — 90 Paratypes) 14 July 1974, collected by R. Burn and K. N. Bell.

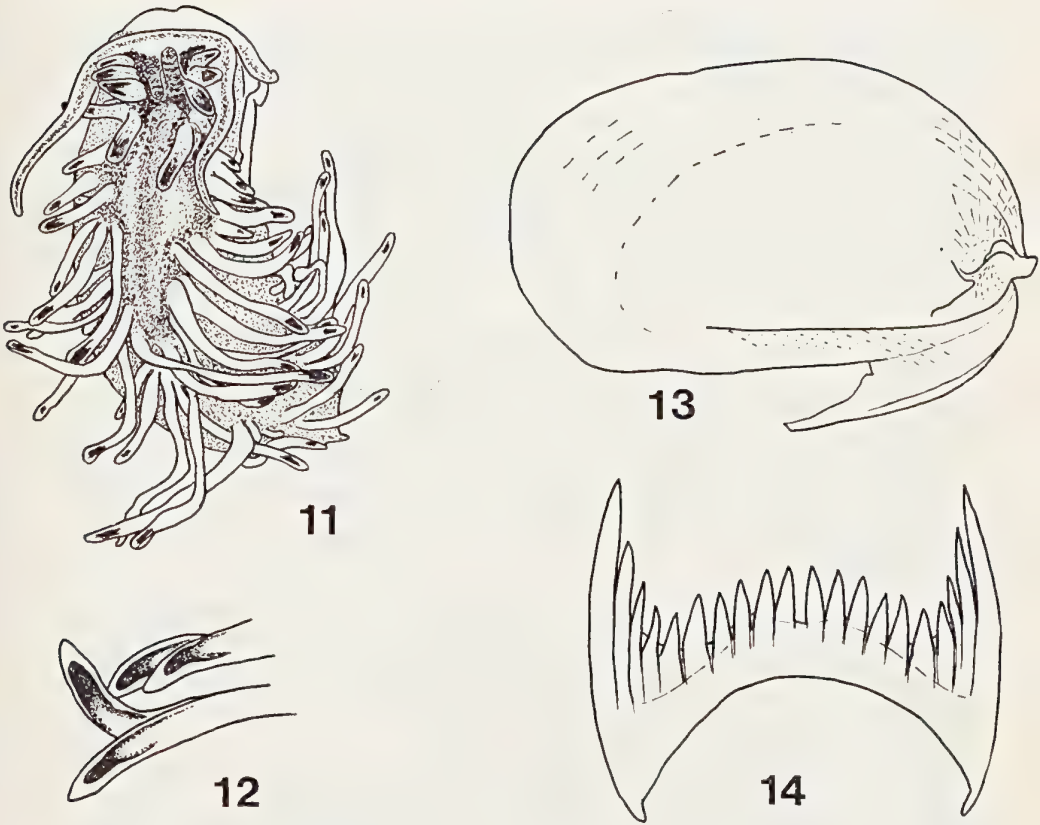
Six specimens (NMV F27927) from pool near top of reef, Point Impossible (S side of mouth of Thompsons Creek, Breamlea), Victoria, on filamentous green algae, 5 March 1973, collected by R. Burn.

Further distribution. Port Phillip Bay: Rosebud pier, on epiphytic algae on *Zostera*, 2 specimens (Burn, 1966c: 270); Ricketts Point, at low water in pool, 2 specimens, 20 September 1970, collected by F. Victor and J. E. Watson.

Description. Animal (Fig. 7) small, slender and up to 14 mm in length. Body rounded in front with a slight median notch, narrower just behind the head and tapering to a long narrow tail. Foot anteriorly wider than body with rounded or sub-angulate corners. Body highest at the pericardium, the ends of which are level with the first and last cerata. Pericardium (Fig. 8) oval anteriorly with high anal papilla projecting obliquely from posterior right side, and drawn out posteriorly into a slender, wavy, tapering hepatic ridge. Renal pore on left hand or dorsal side of anal papilla, pore of melanin black gland on the right posterior side of the anal papilla base. Cerata fusiform, up to 20 each side, anteriorly in rows of three, medianly in pairs, posteriorly singly. Digestive gland greenish or grey, entwined by colourless ducts of the albumen gland. Liver ducts within body extending anteriorly into the proximal third of the rhinophores, and posteriorly to mid-way between cerata and tail tip. Rhinophores slender, tapering, smooth with clear stripe on posterior edge simulating groove. Large lobes descend ventrally from base of rhinophores to anterior edge of head. Male aperture behind level of right rhinophore, common female aperture below second and third rows of cerata. Penis (Fig. 10) translucent white, rounded, short; stylet large, conical, very little bent.

Buccal mass small. Cuticular lining of oral tube with band of conical papillae anterior to pharynx. Radula with 4-5 teeth in upper limb, 6-9 teeth in lower limb and 16-22 teeth heaped in radular sac. Functional tooth (Fig 9) 160 μ m in length. Teeth smooth on ventral edge, indented dorsally.

Two colour forms occur. The exposed form is black all over except for a clear line on the posterior edge of the rhinophores that continues backwards into an oval eye-patch on the side of the head. The sole is translucent grey. The second form, found burrowing through sand grains consolidated around the algal root system, has only the exposed parts heavily pigmented. The upper anterior edges of the cerata are maroon, the rhinophores, anterior head, pericardium and a stripe on the tail are black, the remainder of the body and the sole being translucent pale grey.



TEXT FIGURES 11-14 *Cerberilla incola* sp. nov. 11. Paratype 1, preserved. 12. Ceratal tips to show pattern. 13. Jaw. 14. Tooth.

Discussion. This previously undescribed species has been referred to in the past as *Stiliger* sp. (Burn, 1966c: 270) and *Ercolania* sp. (Burn, 1972: 178, fig. 13).

Ercolania margaritae is separated from other species of the genus by the periodical prolongation and a single female aperture. *E. felina* (Hutton, 1882) from New Zealand also has a periodical prolongation (Eliot, 1907: 330), but personal examination of specimens shows that species to have a blind vaginal ridge (i.e. the vagina terminates in a vesicle below the skin and does not open externally) and a minute curved penial stylet. The *Ercolania* species reported as *E. boodleae* by Kenny (1960: 223; 1970: 85) and as *E. fuscata* by Thompson (1973: 240) from Moreton Bay estuaries, southern Queensland, has neither pericardial prolongation nor high anal-renal papilla, and the vagina is blind. This species needs to be re-examined.

E. margaritae is seasonally abundant on the rock platform at the type locality, but has not been investigated at other localities. On 13 August

1961, the day of discovery, and again on 14 July 1974, it was estimated that at least 12 specimens were present per m², over an area of 50 m by 20 m. Higher densities of up to 50 specimens per m² were noted on some parts of the rock platform.

Egg ribbons have been observed in July, August and September. These are generally 5 mm or more in length by 0.6 mm diameter, oval or irregular in shape, and may be laid on any hard substrate (rock or shell) or on the food algae. The yellow eggs are 80 μm in diameter, very closely packed in tight spirals without any irregularities.

The species is named for the writer's wife, Margaret Burn, who participated in its discovery and original density count.

Dorididae

Doris cameroni (Allan, 1947)

Archidoris cameroni Allan, 1948: 450, pl. 42, fig. 6-7.

Staurodoris pustulata. Basedow and Hedley, 1905: 151, pl. 9, fig 3 (non *Doris pustulata* Abraham, 1877).

Austrodoris peculiaris. Burn, 1962: 157, fig. 7-9; 1966c: 274 (non *Doris peculiaris* Abraham, 1877).

Archidoris varia. Burn, 1957a: 20 (non *Doris varia* Abraham, 1877).

Material. Two minute specimens from one FWD station: 984 (2) E of Sorrento, 12 m.

Remarks. The specimens are both 2.44 x 1.44 mm in length by breadth, pinkish white in colour, notably lowly tuberculate with tubercles protecting the rhinophoral cavities, 4-5 branchiae, broad sole anteriorly entire, and with tumid orals. They agree wholly with material previously identified as *Archidoris varia* and *Austrodoris peculiaris* in Victorian waters (Burn, 1957a, 1962, 1966c).

The complex synonymy of this species is the result of continual misidentification. After examination of the type specimens of *Archidoris cameroni*, *Doris pustulata* and *Doris peculiaris*, the writer is convinced that the first specific taxon applies to this species. *Doris pustulata* Abraham, 1877, is now known as *Hoplodoris nodulosa* (Angas, 1864). *Doris peculiaris* Abraham, 1877, is identical with *Doriopsilla staminea* (Basedow and Hedley, 1905), which species will now be known as *Doriopsilla peculiaris* (Abraham, 1877).

The species is transferred to *Doris* because of the presence of a flat strap-like prostatic section of the male efferent duct, not previously observed (Burn, 1962: 157, fig. 9). *Doris cameroni* is widely distributed throughout southern Australia, occurring from northern New South Wales to Tasmania, as well as in Victoria, South Australia, and south Western Australia.

Aeolidiidae

Cerberilla incola sp. nov.

Figures 11-14

Material. Three specimens from three FWD stations: 940(1) Corio Bay, 12 m; 20 November 1973 (NMV F27919 — Holotype); 946 (1) E of Portarlington, 20 m (NMV F 27920 — Paratype); 977 (1) W of Mount Martha, 20 m, November 1973 (NMV F27921 — Paratype 2).

Opisthobranchs

Description. Body (Fig. 11) short, broad and convex. Foot broader than body, anteriorly truncate with tentaculiform foot corners, posteriorly rounded. Muscular muzzle projects forward, bluntly conical with broad ploughing shield above. Tentacles about one third as long as body, thick at base and tapering to slender tip. Rhinophores short, cylindrical, bases close together, distally wrinkled in preservative. Notum broad anteriorly. Cerata in two single rows in right liver and in up to 13 single rows in the posterior liver; in anterior three rows, cerata short and very broad; in other rows, cerata long, proximally flattened, distally cylindrical, and very crowded. Anus below anterior end of fifth cerata row, renal pore below the fourth cerata row, and the genital pores below third cerata row.

Animals generally brownish. A dark brown line on the tentacles joins across the head. Rhinophores dark brown, with a transverse area around their bases that continues laterally into a dark patch along the anterior of the first row of cerata. Muzzle opaque with fine brown speckling. Bare notum brown, deeper brown laterally beside the cerata and in the middle line, where there may be a slender stripe. Anterior foot, tentaculiform foot corners and anterior upper margins of foot brown or dark brown. Cerata brown on upper (i.e. anterior) surface only, those nearer the middle line additionally marked distally by a dark brown arrow-head (Fig. 12). Sole opaque white.

Dimensions (in mm) of the Holotype are: length 7.2, breadth 3.8, rhinophores 0.75, tentacles 2.5, anterior cerata 0.75, posterior cerata 2.7. Paratypes 1 and 2 respectively 3.8 and 12 mm long, 1.6 and 7 mm broad, with the longest cerata 1.8 and 5 mm.

Brown jaws (Fig. 13) 2.2 mm long, oval in shape, with smooth of which is 2.40 μm wide and the newest 280 μm . Newest tooth (Fig. 14) masticatory borders. Pale radula 2.2 mm long with 22 teeth, the oldest has 10 denticles each side of the central notch; marginal denticles longest, secondary denticles absent. Older teeth with only 8 denticles each side, denticles not greatly abraded.

Discussion. The shape of the jaws without a projecting bosse, the deeply concave shape of the teeth, and the two simple rows of cerata in the right liver allies *C. incola* to *C. asamusiensis* Baba (1940: 109) from Asamusi, Mutu Bay, northern Japan, and *C. bernadettæ* Tardy (1965: 1) from Bas-Poitou on the Atlantic coast of France. From both species, *C. incola* is separated by having only one, not two or three, long marginal denticles on the teeth, darker body colour, and different colour patterning. *C. incola* differs from other species with two simple rows of cerata in the right liver (Burn, 1966b: 28) in the absence of secondary denticles on the radular teeth.

Its presence on the soft bottom areas of Port Phillip Bay suggests that *C. incola*, like other species of the genus (Collier and Farmer, 1964; Tardy, 1965; Burn, 1966b), is a burrowing species.

This is the first record of *Cerberilla* for southern Australia. The specific taxon is the Latin *incola* — a resident or native.

ZOOGEOGRAPHY

The two new species belong to genera with world-wide distributions throughout tropical and temperate seas. *Ercolania margaritæ* is remarkable

for its annual occurrence in vast numbers at its type locally. *Cerberilla incola* relates in size and radular teeth to congeners from high middle latitudes in the Northern Hemisphere, rather than to the larger species of the tropics.

The other ten species have varying distributions in southern and eastern Australia. *Philine angasi*, *Liloea brevis* and *Doris cameroni* occur from northern New South Wales in the east to the Cape Naturaliste — Rottneest Island area of south Western Australia in the west, including Tasmania. *Chemnitzia maria* and *Pyrgiscus fusca* range from New South Wales to South Australia, including Tasmania. *Austrocylichna exigua* and *Haminoea maugeansis* have been found only in central Victoria, Tasmania and South Australia, and *Retusa pelyx* only in central Victoria and possibly Tasmania. *Aglaja (Philinopsis) taronga* is widely distributed along the eastern seaboard from southern Queensland to Tasmania, as well as in New Zealand. It has not been found further west than Port Phillip Bay. *Aglaja (Melanochlamys) queritor* is presently recorded only from central and western Victoria.

All the species may be regarded as belonging to the temperate fauna of southern Australia. Those with wide distribution from east to west including Tasmania can tolerate considerable fluctuation of sea temperatures, whereas those with narrower distributions in Victoria, South Australia and Tasmania, or only Victoria and Tasmania, are less tolerant, especially of higher temperature. Probably the latter species should be set apart as belonging to the cool-temperate fauna centred upon Tasmania.

REFERENCES

- ADAMS, A., 1854. *Thesaurus Conchyliorum*, 2 (p. 589, pl. 125).
 ———, 1878. *Proc. Zool. Soc. Lond.*, p. 869.
 ALLAN, J., 1947. Nudibranchia from the Clarence River Heads etc. *Rec. Aust. Mus.*, 21(8): 433-463, pl. 41-43.
 BABA, K., 1940. Some additions to the nudibranch fauna of the northern part of Japan. *Bull. Biogeogr. Soc. Japan*, 10(6): 103-111.
 BASEDOW, H. and C. HEDLEY, 1905. South Australian nudibranchs, etc. *Trans. R. Soc. S. Aust.*, 29: 134-160, pl. 1-12.
 BURN, R., 1957a. On some Opisthobranchia from Victoria. *J. Malac. Soc. Aust.*, 1(1): 11-29.
 ———, 1957b. A new species of Opisthobranchia from Victoria. *Vict. Nat.*, 74(8): 115-117.
 ———, 1962. Notes on a collection of Nudibranchia (Dorididae and Dendrodorididae) from South Australia. *Mem. Nat. Mus. Vict.*, 25: 149-172, pl. 1.
 ———, 1956a. Some opisthobranchs from southern Queensland. *J. Malac. Soc. Aust.*, 1(9): 96-109.
 ———, 1966b. Descriptions of Australia Eolidacea, 4. The genera *Pleurolidia*, *Fiona*, *Fiona*, *Learchis* and *Cerberilla*. *J. Malac. Soc. Aust.*, 1(10): 21-34.
 ———, 1966c. Port Phillip Survey 1957-1963. Opisthobranchia. *Mem. Natn. Mus. Vict.*, 27: 265-288.
 ———, 1966d. Notes on some opisthobranchs mainly from South Australia. *Rec. S. Aust. Mus.* 15(2): 329-352.
 ———, 1969. A memorial report on the Tom Crawford collection of Victorian Opisthobranchia. *J. Malac. Soc. Aust.*, 1(12): 64-106, pl. 4.
 ———, 1972. A guide to the Ascoglossa or sap-sucking sea-slugs of Australia. *Aust. Nat. Hist.*, 17(5): 174-178.
 BURN, R. and K. N. BELL, 1974. Description of *Retusa pelyx* Burn sp. nov. and its food resources from Swan Bay, Victoria. *J. Malac. Soc. Aust.*, 3(1): 37-42.
 COLLIER, C. and W. FARMER, 1964. Additions to the nudibranch fauna of the East Pacific and Gulf of California. *Trans. San Diego Soc. Nat. Hist.*, 13(19): 377-396.
 COTTON, B. C., 1959. *South Australian Mollusca. Archaeogastopoda*. 449 pp. Government Printer, Adelaide.
 COTTON, B. C. and F. K. GODFREY, 1933. South Australian shells, 7. *S. Aust. Nat.*, 14(3): 72-100, pl. 1-4.
 ———, 1938. A systematic list of the Gastropoda. The marine, freshwater and land univalve Mollusca of South and Central Australia. *Malac. Soc. S. Aust.*, Publ. 1: 1-44.
 ELIOT, C., 1907. Nudibranchs from New Zealand and the Falkland Islands. *Proc. Malac. Soc. Lond.*, 7: 327-361, pl. 28.

- HEDLEY, C., 1917. Studies on Australian Mollusca, 13. *Proc. Linn. Soc. N.S.W.*, 41: 680-719, pl. 46-52.
- KENNY, R. 1960. Some opisthobranch molluscs from Queensland. *Pap. Dept. Zool., Univ. Qd.*, 1: 223-228.
- , 1970. A second collection of opisthobranch molluscs from Queensland. *Pap. Dept. Zool., Univ. Qd.*, 5:83-96.
- LASERON, J., 1951. The New South Wales Pyramidellidae and the genus *Mathilda*. *Rec. Aust. Mus.*, 12 (4): 298-334.
- , 1959. The family Pyramidellidae from Northern Australia. *Aust. J. Mar. Freshw. Res.*, 10: 177-267.
- MACPHERSON, J. H. and E. H. CHAPPLE. A systematic list of the marine and estuarine Mollusca of Victoria. *Mem. Natn. Mus. Vict.*, 17: 107-156.
- MACPHERSON, J. H. and C. J. GABRIEL, 1962. *Marine Molluscs of Victoria*. 15 + 475 pp, Melbourne University Press: Melbourne.
- MAHON, B. P. G., 1973. *Environmental Study of Port Phillip Bay. Report on Phase One 1968-71*. 372 pp., maps. Melbourne and Metropolitan Board of Works and Fisheries and Wildlife Department of Victoria, Melbourne.
- MAY, W., 1921. *A Check-list of the Mollusca of Tasmania*. 114 pp. Government Printer, Tasmania.
- , 1923. *An Illustrated Index of Tasmanian Shells*. 47 pls. Government Printer, Tasmania.
- PILSBRY, H. 1893-95. *Manual of Conchology*, 15. 436 pp., 61 pls.
- PRITCHARD, G. B. and J. H. GATLIFF, 1903. Catalogue of the marine shells of Victoria, 6. *Proc. R. Soc. Vict.*, 15 (2): 176-223.
- REEVE, L., 1869. *Conchologia Iconica*, 17.
- RUDMAN, W. B., 1970. *Chelidonura inornata* Baba and *C. electra* sp. nov. from the Solomon Is. *J. Malac. Soc. Aust.*, 2 (1): 7-12.
- , 1972a. On *Melanochlamys* Cheeseman, 1881, a genus of the Aglajidae. *Pacif. Sci.*, 26 (1): 50-62.
- , 1972b. A comparative study of the genus *Philinopsis* Pease, 1860. *Pacif. Sci.*, 26 (4): 381-399.
- , 1972c. Structure and functioning of the gut in the Bullomorpha, 4. Aglajidae. *J. Nat. Hist.*, 6 (4): 574-560.
- , 1973. One some species of *Chelidonura* from Zanzibar and Fiji. *Zool. J. Linn. Soc.*, 52 (3): 201-215.
- TARDY, J., 1965. Description et biologie de *Cerberilla bernadetti* (sic), espèce nouvelle de la côte atlantique française. *Bull. Inst. Océanogr. Monaco*, 65 (no. 1349): 22 pp., 6 pls.
- TATE, R. and W. May., 1901. A revised census of the marine Mollusca of Tasmania. *Proc. Linn. Soc. N.S.W.*, 26 (3): 344-471, pl. 23-27.
- THOMPSON, T. E., 1973. Sacoglossan gastropod molluscs from eastern Australia. *Proc. Malac. Soc. Lond.*, 40:239-251.